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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/566,301

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EXAMINER

BERMAN, JASON

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/566,301	Applicant(s) TSUKAMOTO, SHIRO	
	Examiner Jason M. Berman	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 7 and 9-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 7, 9-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/4/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1, 7 and 9-26 are pending in the current application.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 9-10, 15 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Pavate (US 6,139,701).

As to claim 1, Pavate discloses a target having an inner face having a surface roughness of $R_a < 1.0 \mu\text{m}$ (abstract: target with surface roughness of less than 20 μ -inches [$\sim 0.13 \mu\text{m}$]; figure 1: showing target 102 with inner face 102a).

As to claim 9, Pavate discloses a target having an inner bottom face having a surface roughness of $R_a < 0.5 \mu\text{m}$ (abstract: target with surface roughness of less than 20 μ -inches [$\sim 0.13 \mu\text{m}$]; figure 1: showing target 102 with inner face 102a).

As to claims 10 and 15, Pavate discloses the target includes a cylindrical peripheral face and bottom face (figure 1: bottom face 102a and unlabeled angled cylindrical face) where the surface roughness of the bottom face is equal to the surface roughness of the cylindrical peripheral face (abstract: surface roughness of entire target less than 20 μ -inches).

As to claim 22, Pavate discloses the target is made of a cladding material (abstract: copper target).

3. Claims 1, 7, 9 and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamakoshi (US 6,153,315).

As to claim 1, Yamakoshi discloses a target having an inner face having a surface roughness of $Ra < 1.0 \mu m$ (claim 2).

As to claim 7 Yamakoshi discloses a method of surface finishing a target by polishing and etching the face of the target so as to make the surface roughness $< 1 \mu m$ (claim 2; col 5 line 17: polishing and etching used to reduce roughness).

As to claim 9, Yamakoshi discloses a target having an inner face having a surface roughness of $Ra < 0.5 \mu m$ (claim 2).

As to claim 22, Yamakoshi discloses the sputtering target is formed from a cladding material (col 15 line 45: target of Ti, Ta or the like).

As to claim 24, Yamakoshi discloses the roughness of the target face is less than $0.5 \mu m$ during the polishing and etching step (col 5 line 17: polishing and etching used to reduce roughness; claim 2).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 11-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pavate, as applied to claims 1 and 10 above, and further in view of Kulkarni (US 6,283,357) and Buehler (US 2002/0079217).

As to claims 11, 16 and 20, Pavate is silent as to an outer peripheral edge and a rough face to this edge.

Kulkarni discloses a hollow clad sputtering target with a bottom inside surface, a peripheral cylindrical surface, and an outer peripheral edge (abstract, figure 3). The target shape of Kulkarni is disclosed as giving a greater percentage of utilization of sputter material.

Buehler discloses a sputtering target treatment in which peripheral areas of the target are roughened by imprints (abstracts). The roughening of these regions is disclosed as reducing the flaking of material from surfaces in the sputtering chamber (paragraph 6 and 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cup shaped target as disclosed by Kulkarni with the target of Pavate, because the shape increases target utilization. Additionally, it would have

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been obvious to one of ordinary skill in the art at the time of the invention to roughen the outer periphery of the target, as disclosed by Buehler, because the roughened surface prevents material from flaking off onto the substrate.

As to claims 12, 17 and 21, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, the limitation of “abrasive blasted” has not been given patentable weight. These claims therefore fall within the disclosure of Pavate in view of Kulkarni and Buehler.

As to claims 13 and 18, Kulkarni discloses the target is made from a cladding material (abstract).

As to claims 14 and 19, Kulkarni discloses the bottom face is a non-erosion portion of the target (figure 3: showing cup-shaped target structure).

7. Claims 11-14 and 16-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakoshi, as applied to claims 1 and 10 above, and further in view of Kulkarni (US 6,283,357) and Buehler (US 2002/0079217).

As to claims 11, 16 and 20, Yamakoshi is silent as to an outer peripheral edge and a rough face to this edge.

Kulkarni discloses a hollow clad sputtering target with a bottom inside surface, a peripheral cylindrical surface, and an outer peripheral edge (abstract, figure 3). The target shape of Kulkarni is disclosed as giving a greater percentage of utilization of sputter material.

Buehler discloses a sputtering target treatment in which peripheral areas of the target are roughened by imprints (abstracts). The roughening of these regions is

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disclosed as reducing the flaking of material from surfaces in the sputtering chamber (paragraph 6 and 7).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cup shaped target as disclosed by Kulkarni with the target of Yamakoshi, because the shape increases target utilization. Additionally, it would have been obvious to one of ordinary skill in the art at the time of the invention to roughen the outer periphery of the target, as disclosed by Buehler, because the roughened surface prevents material from flaking off onto the substrate.

As to claims 12, 17 and 21, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, the limitation of “abrasive blasted” has not been given patentable weight. These claims therefore fall within the disclosure of Yamakoshi in view of Kulkarni and Buehler.

As to claims 13 and 18, Kulkarni discloses the target is made from a cladding material (abstract).

As to claims 14 and 19, Kulkarni discloses the bottom face is a non-erosion portion of the target (figure 3: showing cup-shaped target structure).

8. Claims 23, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakoshi as applied to claims 1, 7 and 24 above, and further in view of Kulkarni.

As to claims 23, 25 and 26, Yamakoshi is silent as to the shape of the target.

Kulkarni discloses a hollow clad sputtering target with a bottom inside surface, a peripheral cylindrical surface, and an outer peripheral edge (abstract, figure 3). The

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target shape of Kulkarni is disclosed as giving a greater percentage of utilization of sputter material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cup shaped target as disclosed by Kulkarni with the target of Yamakoshi, because the cup shape increases target utilization.

9. Claims 23 is rejected under U.S.C. 103(a) as being unpatentable over Pavate as applied to claim 1 above, and further in view of Kulkarni.

As to claim 23 Pavate is silent as to the shape of the target.

Kulkarni discloses a hollow clad sputtering target with a bottom inside surface, a peripheral cylindrical surface, and an outer peripheral edge (abstract, figure 3). The target shape of Kulkarni is disclosed as giving a greater percentage of utilization of sputter material.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a cup shaped target as disclosed by Kulkarni with the target of Pavate, because the cup shape increases target utilization.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Berman whose telephone number is (571)270-5265. The examiner can normally be reached on M-R 8am-5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

/J. M. B./
Examiner, Art Unit 1795